PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

To:

Commissioner
US Department of Commerce
United States Patent and Trademark Office, PCT
2011 South Clark Place Room CP2/5C24
Arlington, VA 22202
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 15 January 2001 (15.01.01)	
International application No. PCT/GB00/01813	**Applicant's or agent's file reference** 8.41.69960/001
International filing date (day/month/year) 11 May 2000 (11.05.00)	**Priority date** (day/month/year) 11 May 1999 (11.05.99)
Applicant HESSE, Robert, Henry et al	

1. The designated Office is hereby notified of its election made:

[X] in the demand filed with the International Preliminary Examining Authority on:

08 December 2000 (08.12.00)

[ ] in a notice effecting later election filed with the International Bureau on:

2. The election [X] was

[ ] was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO **34, chemin des Colombettes** **1211 Geneva 20, Switzerland**	Authorized officer Juan Cruz
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

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EE	Estonia	LR	Liberia	SG	Singapore		

INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB 00/01813

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C07J9/00 C07J41/00 A61K31/575 C07J51/00 A61P17/02
A61P19/08 A61P37/06 A61P29/00 A61P35/00 A61P21/00
A61P9/10 A61P5/20 A61P17/00 A61P9/12 A61P19/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 C07J A61K A61P

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
CHEM ABS Data, EPO-Internal, WPI Data, PAJ, BEILSTEIN Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CHEMICAL ABSTRACTS, vol. 131, no. 8, 23 August 1999 (1999-08-23) Columbus, Ohio, US; abstract no. 97731, MOUNTFORD, JOANNE C. ET AL: "Estrone potentiates myeloid cell differentiation: a role for 17.beta.-hydroxysteroid dehydrogenase in modulating hemopoiesis" XP002147254 abstract & EXP. HEMATOL. (N. Y.) (1999), 27(3), 451-460 , -/--	1-21

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
18 September 2000	28/09/2000

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax (+31-70) 340-3016	Watchorn, P

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

In ational Application No
PCT/GB 00/01813

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A61P11/06 A61P25/28 A61P15/18 A61P7/02 A61P3/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CHEMICAL ABSTRACTS, vol. 120, no. 23, 6 June 1994 (1994-06-06) Columbus, Ohio, US; abstract no. 290344, LAJEUNESSE, DANIEL: "Effect of 17.beta.-estradiol on the human osteosarcoma cell line MG-63" XP002147255 abstract & BONE MINER. (1994), 24(1), 1-16 ,	1-21

-/—

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
18 September 2000	

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl. Fax: (+31-70) 340-3016	Watchorn, P

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Int. ational Application No
PCT/GB 00/01813

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CHEMICAL ABSTRACTS, vol. 119, no. 7, 16 August 1993 (1993-08-16) Columbus, Ohio, US; abstract no. 63468, ESCALEIRA, MARIA TERESA F. ET AL: "Sex steroids induced up-regulation of 1,25-dihydroxyvitamin D3 receptors in T 47D breast cancer cells" XP002147256 abstract & J. STEROID BIOCHEM. MOL. BIOL. (1993), 45(4), 257-63 ,	1-21
A	CHEMICAL ABSTRACTS, vol. 116, no. 25, 22 June 1992 (1992-06-22) Columbus, Ohio, US; abstract no. 248829, LIEL, YAIR ET AL: "Evidence that estrogens modulate activity and increase the number of 1,25-dihydroxyvitamin D receptors in osteoblast-like cells (ROS 17/2.8)" XP002147257 abstract & ENDOCRINOLOGY (BALTIMORE) (1992), 130(5), 2597-601 ,	1-21
A	US 3 562 260 A (RUGGIERI PIETRO DE ET AL) 9 February 1971 (1971-02-09) column 2, line 8 - line 26; examples 3,4,6,11,21	1-21
A	US 3 717 627 A (LAING S ET AL) 20 February 1973 (1973-02-20) column 1, paragraph 2; example 4	1-21

INTERNATIONAL SEARCH REPORT

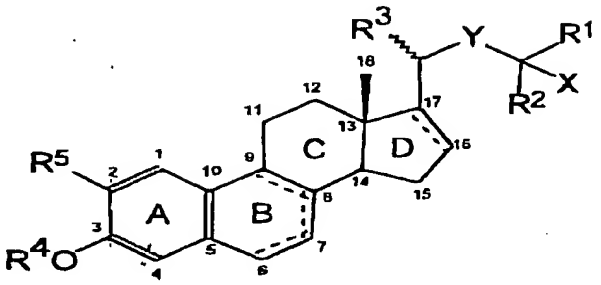
Information on patent family members

In ...tional Application No
PCT/GB 00/01813

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 3562260 A	09-02-1971	US 3494918 A	10-02-1970
US 3717627 A	20-02-1973	CH 568335 A	31-10-1975
		DE 1926574 A	24-09-1970
		DK 125200 B	15-01-1973
		FR 2009257 A	30-01-1970
		GB 1267915 A	22-03-1972
		JP 50011911 B	07-05-1975
		NL 6907883 A	26-11-1969

Claims:

1. Compounds of formula (I)



(I)

in which:

R^1 and R^2, which may be the same or different, each represents a lower alkyl, alkenyl or alkynyl group;

R^3 represents a methyl group having α- or β-configuration;

R^4 represents a hydrogen atom or an etherifying or esterifying group;

R^5 represents a hydrogen atom, a hydroxyl group or a lower alkoxy group;

X represents a group OR^4, wherein R^4 is as defined above, or a group NR^6R^7 wherein R^6 represents a hydrogen atom, an aliphatic or araliphatic organic group, or an acyl group comprising an aliphatic, araliphatic or aryl organic group linked to the nitrogen atom by way of a carbonyl group; and R^7 is a hydrogen atom or a lower alkyl group;

Y represents a lower alkylene, alkenylene or alkynylene group optionally substituted by a hydroxyl, etherified hydroxyl or esterified hydroxyl group; and

the dotted lines signify that double bonds may be present at the 16(17)-position and/or either at the 6(7)- and 8(9)-positions or at the 7(8)-position.

2. Compounds of formula (I) as claimed in claim 1

wherein R^1 and R^2 are independently selected from C_{1-6} alkyl groups and C_{2-7} alkenyl and alkynyl groups.

3. Compounds of formula (I) as claimed in claim 2 wherein R^1 and R^2 are straight chain groups.

4. Compounds of formula (I) as claimed in claim 2 wherein R^1 and R^2 are selected from methyl, ethyl and propargyl groups.

5. Compounds of formula (I) as claimed in any of the preceding claims wherein R^4 a hydrogen atom, a silyl group, a C_{1-6} alkyl group optionally interrupted by one or more oxygen atoms or substituted by a lower cycloalkyl group, a cyclic ether group, a C_{1-6} alkanoyl group, an aroyl group, a C_{1-6} alkane sulphonyl or halogenated methane sulphonyl group, or an arene sulphonyl group.

6. Compounds of formula (I) as claimed in claim 5 wherein R^4 is a hydrogen atom.

7. Compounds of formula (I) as claimed in claim 5 wherein R^4 is a metabolically labile group or a lower alkyl group.

8. Compounds of formula (I) as claimed in any of the preceding claims wherein R^5 represents a hydrogen atom or a methoxy group.

9. Compounds of formula (I) as claimed in any of the preceding claims wherein X represents a hydroxyl group or a group of formula NR^6R^7 wherein:

R^6 is a C_{1-6} alkyl group, C_{6-12} carbocyclic aryl C_{1-4} alkyl group, C_{1-6} alkanoyl group, C_{6-12} carbocyclic aryl C_{2-5} alkanoyl group, C_{7-13} carbocyclic aroyl group or any of the preceding groups substituted by one or more halo,

C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkanoyl, C_{1-4} alkylamino, di(C_{1-4} alkyl)amino, nitro, carbamoyl or C_{1-4} alkanoylamino substituents; and

R^7 is a hydrogen atom or a C_{1-6} alkyl group.

10. Compounds of formula (I) as claimed in claim 9 wherein X represents a hydroxyl, amino, methylamino, ethylamino, N-ethyl-N-methylamino, acetylamino, benzamido or phenylacetylamino group.

11. Compounds of formula (I) as claimed in any of the preceding claims wherein Y contains up to 7 carbon atoms and up to 3 multiple bonds.

12. Compounds of formula (I) as claimed in claim 11 wherein Y is a straight chain C_{2-6} group.

13. Compounds of formula (I) as claimed in any of the preceding claims wherein Y is substituted by a hydroxyl, etherified hydroxyl or esterified hydroxyl group positioned α-, β- or γ- to the group $-C(R^1)(R^2).X$ or α- to any triple bond present in the group Y.

14. Compounds as claimed in claim 11 wherein Y is selected from ethylene, trimethylene, tetramethylene, vinylene, buta-1,3-dienylene, prop-2-ynylene and 1-hydroxyprop-2-ynylene.

15. Compounds of formula (I) as claimed in claim 1 wherein:

R^1 and R^2, which may be the same or different, each represents a lower alkyl group;

R^5 represents a hydrogen atom; and

X represents a group NR^6R^7 wherein R^7 is hydrogen.

16. The compounds:

25-acetylamino-3-hydroxy-24-homo-19-nor-cholest-1,3,5(10),16-tetraene;

25-ethylamino-3-hydroxy-24-homo-19-nor-cholest-1,3,5(10),16-tetraene;

25-methylamino-3-hydroxy-24-homo-19-nor-cholest-1,3,5(10),16-tetraene;

25-dimethylamino-3-hydroxy-24-homo-19-nor-cholest-1,3,5(10),16-tetraene;

25-(N-ethyl-N-methylamino)-3-hydroxy-24-homo-19-nor-cholest-1,3,5(10),16-tetraene;

25-acetylamino-3-methoxy-24-homo-19-nor-cholest-1,3,5(10),16-tetraene;

25-acetylamino-3-ethoxy-24-homo-19-nor-cholest-1,3,5(10),16-tetraene;

25-acetylamino-3-isobutoxy-24-homo-19-nor-cholest-1,3,5(10),16-tetraene;

25-benzamido-3-hydroxy-24-homo-19-nor-cholest-1,3,5(10),16-tetraene;

25-phenylacetylamino-3-hydroxy-24-homo-19-nor-cholest-1,3,5(10),16-tetraene;

25-acetylamino-3-hydroxy-24-homo-19-nor-cholest-1,3,5(10)-triene;

3,24-dihydroxy-24-propargyl-19-26,27-trisnor-cholest-1,3,5(10)-triene;

2-methoxy-3,24-dihydroxy-24-propargyl-19,26,27-trisnor-cholesta-1,3,5(10)-triene;

3,24-dihydroxy-20-epi-24-propargyl-19,26,27-trisnor-cholest-1,3,5(10)-triene;

3,24-dihydroxy-24,24-bispropargyl-19-nor-chol-1,3,5(10),22-tetraene;

2-methoxy-3,24-dihydroxy-24,24-bispropargyl-19-nor-chol-1,3,5(10),22-tetraene;

3,24-dihydroxy-20-epi-24,24-bispropargyl-19-nor-chol-1,3,5(10),22-tetraene;

3-hydroxy-25-amino-26,27-bishomo-19-nor-cholest-

1,3,5(10)-trien-23-yne;

2-methoxy-3-hydroxy-25-amino-26,27-bishomo-19-nor-cholest-1,3,5(10)-trien-23-yne;

3-hydroxy-20-epi-25-amino-26,27-bishomo-19-nor-cholest-1,3,5(10)-trien-23-yne;

3-hydroxy-25-amino-26,27-bishomo-19-nor-cholest-1,3,5(10)-triene;

2-methoxy-3-hydroxy-25-amino-26,27-bishomo-19-nor-cholesta-1,3,5(10)-triene;

3-hydroxy-20-epi-25-amino-26,26-bishomo-19-nor-cholesta-1,3,5,(10)-triene;

3-hydroxy-25-acetylamino-26,27-bishomo-19-nor-cholest-1,3,5(10)-trien-23-yne;

2-methoxy-3-hydroxy-25-acetylamino-26,27-bishomo-19-nor-cholest-1,3,5(10)-trien-23-yne;

3-hydroxy-20-epi-25-acetylamino-26,27-bishomo-19-nor-cholest-1,3,5(10)-trien-23-yne;

3,22-dihydroxy-25-amino-26,27-bishomo-19-nor-cholest-1,3,5(10)-trien-23-yne;

2-methoxy-3,22-dihydroxy-25-amino-26,27-bishomo-19-nor-cholest-1,3,5(10)-trien-23-yne;

3,22-dihydroxy-20-epi-25-amino-26,27-bishomo-19-nor-cholest-1,3,5(10)-trien-23-yne;

2-methoxy-3-hydroxy-24-homo-25-acetylamino-19-nor-cholest-1,3,5(10),16-tetraene;

2-methoxy-3-hydroxy-24-homo-25-amino-19-nor-cholest-1,3,5(10),16-tetraene;

2-methoxy-3-hydroxy-25-acetylamino-19-nor-cholest-1,3,5(10),16-tetraene;

2-methoxy-3-hydroxy-25-amino-19-nor-cholest-1,3,5(10),16-tetraene;

3-hydroxy-24-homo-25-acetylamino-19-nor-cholest-1,3,5(10),6,8,16-hexaene;

3-hydroxy-24-homo-25-amino-19-nor-cholest-1,3,5(10),6,8,16-hexaene;

3,25-dihydroxy-19-nor-cholest-1,3,5(10)-trien-23-yne;

3,25-dihydroxy-19-nor-cholest-1,3,5(10)-triene;

2-methoxy-3,25-dihydroxy-19-nor-cholest-1,3,5(10)-trien-23-yne;

3,25-dihydroxy-20-epi-19-nor-cholest-1,3,5(10)-trien-23-yne;

2-methoxy-3,25-dihydroxy-19-nor-cholest-1,3,5(10)-triene;

3,25-dihydroxy-20-epi-19-nor-cholest-1,3,5(10)-triene;

3,25-dihydroxy-24,24a-bishomo-19-nor-cholest-1,3,5(10),22;24(24a)-pentaene;

25-amino-3-hydroxy-20-epi-24-homo-19-nor-cholest-1,3,5(10),16-tetraene;

25-acetylamino-3-hydroxy-20-epi-24-homo-19-nor-cholest-1,3,5(10),16-tetraene;

25-amino-3-hydroxy-20-epi-19-nor-cholest-1,3,5(10),16-tetraene;

25-acetylamino-3-hydroxy-20-epi-24-homo-19-nor-cholest-1,3,5(10),16-tetraene;

3-hydroxy-24-homo-25-acetylamino-19-nor-cholest-1,3,5(10),6,16-pentaene; and

3-hydroxy-24-homo-25-amino-19-nor-cholest-1,3,5(10),6,16-pentaene.

17. Active compounds of formula (I) as claimed in any preceeding claim for use in management of neoplastic disease; as agents to promote wound healing; in burn management; in treatment of bone diseases, autoimmune disease, host-graft reaction, transplant rejection, inflammatory diseases, neoplasias or hyperplasias, myopathy, enteropathy or spondylitic heart disease; in suppression of parathyroid hormone; in treatment of dermatological diseases, hypertension, rheumatoid arthritis, psoriatic arthritis, secondary hyperparathyroidism, asthma, cognitive impairment or senile dementia; in fertility control in either human or animal subjects; in management of disorders involving

blood clotting; or in reduction of serum cholesterol.

18. The use of an active compound of formula (I) as claimed in any one of claims 1 to 16 for the manufacture of a medicament for use in management of neoplastic disease; as an agent to promote wound healing; in burn management; in treatment of bone diseases, autoimmune disease, host-graft reaction, transplant rejection, inflammatory diseases, neoplasias or hyperplasias, myopathy, enteropathy or spondylitic heart disease; in suppression of parathyroid hormone; in treatment of dermatological diseases, hypertension, rheumatoid arthritis, psoriatic arthritis, secondary hyperparathyroidism, asthma, cognitive impairment or senile dementia; in fertility control in either human or animal subjects; in management of disorders involving blood clotting; or in reduction of serum cholesterol.

19. Pharmaceutical compositions comprising an active compound of formula (I) as claimed in any one of claims 1 to 16 in admixture with one or more physiologically acceptable carriers or excipients.

20. A method of treatment of a human or animal subject in the management of neoplastic disease; to promote wound healing; in burn management; in treatment of bone diseases, autoimmune disease, host-graft reaction, transplant rejection, inflammatory diseases, neoplasias or hyperplasias, myopathy, enteropathy or spondylitic heart disease; in suppression of parathyroid hormone; in treatment of dermatological diseases, hypertension, rheumatoid arthritis, psoriatic arthritis, secondary hyperparathyroidism, asthma, cognitive impairment or senile dementia; in fertility control; in management of disorders involving blood clotting; or in reduction of serum cholesterol, which method comprises administering to said subject a therapeutically effective amount of an

active compound of formula (I) as claimed in any of claims 1 to 16.

21. A process for the preparation of a compound of formula (I) as defined in claim 1 which comprises reacting a compound containing a precursor for the desired 17-position side chain in one or more stages and with one or more reactants serving to form the said desired 17-position side chain, followed if necessary and/or desired by removal of any O-protecting group.

PCT

14

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
8.69960/001		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/GB00/01813	11/05/2000	11/05/1999
International Patent Classification (IPC) or national classification and IPC C07J9/00		
Applicant MARSDEN, John, Christopher et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

   ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations suporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☒ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
12/12/2000	14.02.2001
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Ladenburger, C Telephone No. +49 89 2399 8276

Form PCT/IPEA/409 (cover sheet) (January 1994)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB00/01813

I. Basis f th rep rt

1. This report has been drawn on the basis of *(substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments (Rules 70.16 and 70.17).)*:
Description, pages:

1-61 as originally filed

Claims, No.:

1-21 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application.

☒ claims Nos. 20 as to IA.

because:

☒ the said international application, or the said claims Nos. 20 relate to the following subject matter which does not require an international preliminary examination (*specify*):
see separate sheet

☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for the said claims Nos. .

2. A meaningful international preliminary examination report cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the standard.

☐ the computer readable form has not been furnished or does not comply with the standard.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-21
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-21
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-19,21

No: Claims

2. Citations and explanations
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

III. Non-establishment of opinion

Claim 20 relates to subject-matter considered by this Authority to be covered by the provisions of Rule 67.1(iv) PCT. Consequently, no opinion will be formulated with respect to the industrial applicability of the subject-matter of this claim (Article 34(4)(a)(i) PCT).

V.2 Reasoned statement; Citations and explanations

1. Having regard to the fact that the prior art documents cited in the ISR neither disclose the compounds of claim 1 or very close analogs nor relate to compounds which possess the same spectrum of activities, the subject-matter of claims 1-21 can be recognised as novel and inventive vis-à-vis this state of the art. It is obviously industrially applicable (except claim 20).

2. For the assessment of claim 20 on the question whether it is industrially applicable, no unified criteria exist in the PCT Contracting States. The patentability can also be dependent upon the formulation of the claims. The EPO, for example, does not recognize as industrially applicable the subject-matter of claims to the use of a compound in medical treatment, but may allow, however, claims to a known compound for first use in medical treatment and the use of such a compound for the manufacture of a medicament for a new medical treatment.

VIII. Certain observations

1. It is reminded that the breadth of the main claim should be such that it represents a reasonable generalisation over the examples provided, and such that every compound falling within its scope actually provides a solution to the problem underlying the invention.
In the present case, having regard to the limited variety of the compounds effectively prepared and to the absence of any concrete test data in the description, it is questionable whether the scope of claims 1-21 is reasonable and justified. Especially the definitions of R^4, R^6 and Y appear to be to broad and widely speculative.

Thus the Applicant should ensure that principal claim 1 covers only compounds which actually solve the given problem.

2. The relative term "lower" used in several claims has no well-recognised meaning and leaves a doubt as to the meaning of the technical features to which it refers, thereby rendering the definition of the subject-matter of these claims unclear. The number of carbon atoms should be specified according to the description.

3. Claim 16 comprises all the features of claim 1 and is therefore not appropriately formulated as a claim dependent on the latter (Rule 6.4 PCT).

4. The term "active" used in the expression "active compound(s) of formula (I)" in claims 17-20 should be deleted to avoid any ambiguity as to the scope of these claims. The question arise whether this term is intended to have a limiting function, and that not all compounds of formula (I) are actually active (see above VIII.1). If protection is also sought for intermediate compounds, such compounds should be clearly distinguished from the "active" compounds.